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BEES OF THE GENUS ANTHIDIUM FROM PERU

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This brief paper is devoted to Peruvian bees of the genus *Anthidium*, *sensu stricto*, and in the keys an attempt has been made to include all the representatives of this genus known to occur or likely to occur in the area in question. The male of *nigerrimum* has, I believe, not hitherto been described and a new species, *weyrauchi*, is also included.

Anthidium atricaudum Cockerell

Cockerell described this species on the basis of a female from Yura, Peru (1926, Ann. Mag. Nat. Hist., (9) XVII, p. 218). A year previously Friese (1925, Entom. Zeit. Stettin, LXXXVI, p. 40) had described *Anthidium piliventre* on the basis of males and females from Arequipa, Peru. Subsequently (1930, Entom. Zeit. Stettin, XCI, p. 127), Friese withdrew the name *piliventre* from his Peruvian *Anthidium* because he had previously used the name for an African species of *Anthidium* (1913, Zool. Jahrb. Syst. Geogr. u. Biol., XXXV, p. 596). Friese designated *atricaudum* Cockerell as the proper name of the species.

There are before me a male and two females from the type locality of Peruvian *piliventre*; they bear Friese's identification label as *piliventre* and conform with his description of that bee. Some of the structural characters noted for *atricaudum* in the key are based on these specimens. There is variability in this bee, as Friese's description indicates and Cockerell's description tends to emphasize. Only the first two or all the first three tergites of the abdomen may have maculations. Cockerell mentions gray hair "on thorax above (but long black hair on scutellum)." In two females before me the hair on the scutellum is predominantly to wholly gray as is the hair on the mesono-

tum, and in one of them, at least, gray hair covers also the mesopleura. Cockerell in his description mentions only the first abdominal tergite as having gray hair, while Friese indicates that the two basal or even the three basal tergites may have gray hair. The variability in this respect noted by Friese is illustrated in the two female specimens before me.

Anthidium nigerrimum Schrottky

MALE.—*Head* black, with the following parts pale yellow: entire clypeus, sides of face to the level of the antennal sockets, basal two-thirds of mandibles, a spot above each eye. Antennae apparently very variable in coloration. In one of the two specimens (both from Puno, Peru) completely black, in the other completely bright orange-colored except for the four apical joints which are invaded by black below and completely black above. (In the five accompanying females—also from Puno—only one has predominantly orange-colored antennae, the other four having antennae that are exclusively black.) The hairs long and white on the clypeus and sides of face, and a conspicuous dense fringe of white hairs along the side of the scape that is nearest the eye; grayish to whitish hairs (sometimes intermixed with black) on the vertex. The rest of the hairs black or blackish, including a rather heavy fringe on the side of the scape remote from the eye, the hairs of the front, and those on the genae, and the under side of the mandible. The punctuation dense, a little sparser and coarser on the vertex (especially laterally in the area between the lateral ocelli and the compound eyes). The mandibles with only scattered punctuation and shiny, their apex tridentate, the outermost tooth long and acute, the innermost large and tri-

angular. The apex of the clypeus along its middle widely subtruncate to very slightly emarginate, toward the lateral extremities of irregular surface.

Thorax black, without trace of maculation. The mesonotum and scutellum rather densely and exclusively or almost exclusively covered with fairly long whitish hairs; such hairs are present also over the lower half or more of the mesopleura, contrasting with the black hairs of the upper half of the mesopleura and those of the metapleura and propodeum. The punctuation predominantly dense.

Legs with the coxae, trochanters, all but the extreme apex of the femora and the apical half of the tarsal claws black. The remaining parts of the leg a bright orange color. The hairs black on the black areas but red on the orange-colored joints, with the fringe along the posterior lateral contour of the fore tibiae and fore metatarsi yellowish to even somewhat whitish; the hind tibiae with a dense patch of appressed white hairs at the apex posteriorly.

Wings strongly smoky, with mainly violaceous reflections in the basal two-thirds of the forewing, and greenish or bluish to violaceous reflections in the more roughened apical one-third of the wing. The basal vein and the venation apicad of the basal vein as well as the stigma black, but the costal and subcostal veins and other venation basad of the basal vein more or less orange-colored. The tegulae in the darker of the two males black, in the other specimen orange-colored (the single female that agrees with this male in having the antennae orange-colored is also in agreement with it in having the tegulae orange-colored). Number of hamuli per lower wing ranges from twenty to twenty-two.

Abdomen black with a maculation (pale yellow) only on tergite 5 in the case of the two males before me, although it seems probable that this is a variable condition and that the male, like at least one of the accompanying females, may have a spot also at each side of tergite 1 as specified in Schrottky's description of the female of *nigerrimum*. The maculation on tergite 5 consists of two more or less coalescent or

semi-divided and transversely elongate to irregularly suboval spots at the middle of the tergite. The hairs on both the upper surface and the under surface of the abdomen black. The depressed apical part of the several tergites with punctuation denser than that on the basal part of these tergites, but for the most part there are shiny interspaces between the punctures, which at a superficial glance appear denser than is actually the case due to the presence of hairs. Tergite 6 striate-punctate, with the punctures very coarse; a stout somewhat curved spine on each side of tergite 6. Tergite 7 trispinose at the middle of its apex, the outer spines being on a lower level and slightly longer than the middle spine, the three spines as a unit suggesting a little the three legs of a tripod. The last exposed sternite reflexed along its apical edge, with an emargination at the middle.

Length, 12 to 13 mm.; width of thorax, about 5.5 mm.; length of forewing, including tegula, about 10 to 11 mm.

The male of *nigerrimum* has, so far as I am aware, not hitherto been described. The specimens on which this description is based were collected by J. Soukup at Puno, Peru. The unusual grouping of the spines on tergite 7 combined with the limited maculation of the abdomen will aid in differentiating the male of *nigerrimum* from other species of *Anthidium*.

Anthidium weyrauchi, new variety

FEMALE.—*Head* with a small, very pale yellow maculation above each eye, otherwise wholly black. The hair black and rather long, dense and upstanding over the face. The punctuation dense over most of the head, but the vertex (especially laterally in the area between the lateral ocelli and the compound eyes) with shiny interspaces between the punctures, an impunctate band above the basal margin of the clypeus and the six-toothed mandible more or less shiny in places. The clypeus widely subtruncate to slightly emarginate along the middle of its apical edge, which is somewhat upthrust, and with a short but wide subtruncate tooth (or what may be the amalgamation of two teeth) to each side of the lateral extremities of this apical middle. The antennae black, with black hairs fringing the scape.

Thorax entirely black, without trace of maculation. The hairs somewhat sparse on the mesonotum and scutellum, with the shorter

hairs in these areas silvery gray, the longer hairs black. A somewhat conspicuous tuft of white hairs immediately behind the hind wing. The hairs of the pleura and of the under side of the thorax uniformly black. The punctuation rather dense, but a few shiny interspaces between the punctures traceable here and there, more especially on the scutellum and posteriorly on the mesopleura.

Legs with the coxae, trochanters, basal two-thirds of fore femora, the extreme base of the middle and hind femora and the apical half of the tarsal claws black or predominantly black; the apical one-third of the fore femora, most of the middle and hind femora, all of the tibiae, the tibial spurs, all of the tarsal joints, and the basal one-half of the claws a bright contrasting orange color. The hairs black on the coxae, trochanters, and femora and even to some extent on the tibiae and metatarsi (black, for instance, is the thin fringe on the posterior lateral contour of the fore and middle tibiae and the fringe on the anterior lateral contour of the hind tibiae, and black or blackish are the hairs on the posterior lateral contour of the hind metatarsi), but many of the hairs of the tibiae and most of those on the metatarsi and other tarsal joints are a rich fulvous both over the outer face of the joint and on the metatarsal brushes.

Wings strongly smoky, with faint violaceous reflections in the basal two-thirds of the forewing (the part terminating with the apex of the marginal, of the second submarginal and of the third discoidal cells), and bluish to violaceous reflections in the more roughened apical one-third of the wing. The stigma and venation black except that the very base of the wing is cloudy orange-colored. The tegulae black and immaculate, with some gray hairs. The number of hamuli twenty in one hind wing, twenty-two in the other hind wing.

Abdomen black with two very pale yellow spots on tergites 1 to 5, tergite 6 being wholly black. The maculations are most widely separated (each at the lateral extremity of the segment) on tergite 1 and are closest together, with only a relatively narrow area of black separating them, on tergite 5. On the intermediate tergites 2-4, the maculations tend progressively to approach each other, so that the series of spots from the base of the abdomen to tergite 5 arrange themselves roughly in two converging lines, with the spots largest and more or less oval on tergites 1 and 5. The slightly more elevated basal two-thirds of the several tergites with much sparser punctuation than that of the slightly depressed apical one-third of the several tergites; the punctures of this apical part not unduly crowded, however, and with numerous shiny interspaces between punctures or chains of punctures. Tergite 6 with a blunt shoulder-like angulation about midway down each of its sides. The dorsal aspect of the abdomen with black hairs, longest on tergite 1; the ventral scopa black.

Length, about 9 mm.; width of thorax, about

4 mm.; length of forewing, including tegula, about 6.5 mm.

Description based on a single specimen collected at Huaraz, Peru, at 3000 meters, on May 18, 1941, by W. Weyrauch.

The accompanying key to known Peruvian *Anthidium*, *sensu stricto*, or to species which because of their geographic range occur in all probability in Peru will aid in the identification of *weyrauchi*. Among the known females of Peruvian species with black scopa on the under side of the abdomen, *weyrauchi* may be differentiated by its lack of a spine or spines on the apex of tergite 6.

The relationship of *weyrauchi* is closest to *Anthidium rubripes* Friese described from Argentina (1908, Die Apidae von Argentina, p. 70), but *weyrauchi* differs from *rubripes* not only in its more emphatic melanism but also to some extent structurally. The clypeus of *weyrauchi* is slightly emarginate along the middle region of the apex, while the corresponding region of *rubripes* is thickened and somewhat produced. The tooth on each side of tergite 6 is blunt and obtuse in *weyrauchi*, acute and subspine-like in *rubripes*. All the hairs of the head are exclusively black in *weyrauchi*; in *rubripes* there is admixture of lighter hairs, and in the specimens before me identified by Friese as *rubripes* there are red hairs fringing at least the scape, a character that Cockerell notes in the case of his own closely related *chubuti* (1910, Trans. Amer. Ent. Soc., XXXVI, p. 214). The antennae and tegulae of *weyrauchi* are black; those of *rubripes*, of *chubuti* and of *patagonicum* (Schrottky, 1910, Wiener Ent. Zeitung, XXIX, p. 269) are orange, as is indicated in the description of each and substantiated by the specimens before me, which include representatives from the type localities of *rubripes* and of *chubuti*.

Cockerell (1910, Trans. Amer. Ent. Soc., XXXVI, p. 214) regarded *patagonicum* as a synonym of *chubuti*, but I think it doubtful whether *chubuti* can be separated from *rubripes*, which has been reported several times from Argentina and also from Chile (Friese, 1910, Zool. Jahr. Syst. Geogr. u. Biol., XXIX, pp. 644 and 645).

Cockerell's statement to the effect that Friese's *rubripes* is narrower than his own *chubuti* is not borne out by comparison of a specimen from the type locality of *chubuti* and specimens of *rubripes* identified by Friese, and the attempted distinction is further nullified by Cockerell's subsequently published statement in discussing *chubuti* that there "is great variation in size, and the femora may show much or little black" (1917, Canadian Ent., XLIX, p. 252). An erroneous statement of Friese,

which may have induced Cockerell into believing *chubuti* distinct from *rubripes*, is to the effect that *rubripes* has five teeth on the mandible. The female specimens identified by Friese as *rubripes* have, like *chubuti* and *weyrauchi*, six teeth.

Structurally and in the coloration of both the chitin and the hair, *weyrauchi* is distinct from the range of variation noted for *rubripes* and its varieties or synonyms. It is also conspicuously smaller than specimens identified as *rubripes* and *chubuti*.

KEY TO KNOWN PERUVIAN *Anthidium*, SENSU STRICTO

Females

- 1.—Tergites 1–3 of the abdomen with an uninterrupted band, tergites 4–5 with a band that is medianly discontinuous, tergite 6 two-spotted (sometimes at least). The apical margin of the clypeus with six denticles. The legs black. Anal segment of abdomen with a semicircular emargination. Scopa white.... *peruvianum* Schrottky.¹
- Tergites 1–3 of the abdomen without continuous bands, four-spotted or two-spotted or even without maculations..... 2.
- 2.—Clypeus with a horseshoe-shaped maculation. The thorax immaculate. A longitudinal stripe on the outer face of all the tibiae..... *cuzcoensis* Schrottky.
Neither the clypeus nor the thorax maculated or both the clypeus and the thorax maculated; in the latter instance, the maculation on the clypeus not horseshoe-shaped..... 3.
- 3.—The head richly maculated on clypeus, sides of face, mandibles, above the eye and along the vertex as far as lateral ocellus. Thorax with an L-shaped broad band part way along anterior margin of mesonotum and entire lateral margin of mesonotum, confluent or nearly confluent with broad maculation over axillae and extended thence around posterior margin of scutellum (but with an emargination or interruption at apical middle of scutellum). Abdomen usually with twenty-two maculations. Ventral scopa pale..... 4.
- The head (except for a spot above each eye) and the thorax black and devoid of maculations. The ventral scopa black or at least dark brown..... 5.
- 4.—Tergite 6 armed with four acute converging spines, the two outer and more basal spines separated from the two inner and apical spines by a very deep emargination of the lateral contours of the tergite; the apical contour of the tergite at the mid-point between the two inner and apical spines minutely emarginate.... *simulans* Cockerell.²
Tergite 6 with an out-thrust angulation at each side and the apical middle slightly produced and emarginate..... *22-punctatum* Friese.³

¹ I have not seen representatives of either *peruvianum* or *cuzcoensis* and the distinctions noted in this key are based on the description of each.

² Cockerell (1926, Ann. Mag. Nat. Hist., (9) XVII, p. 217) separates *simulans* from Friese's *aricense* mainly because *simulans* has a large, black, wedge-shaped area on the clypeus which *aricense* lacks. A specimen from Arequipa, Peru, tends to bridge the gap between the two, for it has a black W at the base of the clypeus. It may be that *simulans* is at most a variety of *aricense* but, as I have seen the type of the former and have not seen the type of the latter, I have permitted caution to restrain me by retaining the name *simulans* in this key.

³ Friese's *22-punctatum* is doubtfully included in the apifauna of Peru. Friese described *22-punctatum* from Ecuador in 1904 (Zeitsch. Hymenop. u. Dipt., IV, p. 182) and from Argentina in 1908 (Apidae von Argentina, p. 71), which would lead to the belief that this *Anthidium* occurs likewise in Peru. But the two descriptions present points of variance, leaving one in doubt whether the Argentinian bee is the same *22-punctatum* described before from Ecuador. Cockerell (1926, Ann. Mag. Nat. Hist., (9) XVII, p. 217) surmises that *22-punctatum* Friese is a synonym of *deceptum* Smith (1879, Descriptions of New Species of Hymenoptera, British Museum, Apidae, p. 91). Smith's bee was from Peru, a male, but I find it hard to reconcile Smith's observa-

- 5.—The legs black, without maculations. Tergite 6 with four spines, one at each side and two at the apex.....6.
 At least the tibiae and tarsal joints a vivid orange color. At least the sides of tergite 6 without a spine (although sometimes with a tooth or angle); spines, if present, are along the apex.....7.
- 6.—Tergites 1 and 2 (sometimes also 3) with a maculation at each extremity; tergites 3–6 or 4–6 wholly black. The clypeus with a tubercle at the middle of its apex, flanked by a smaller tubercle to each side and with a widely truncate to feebly emarginate tooth laterad of the smaller tubercle. A polished and brightly shiny "dimple" at the middle of the posterior rim of the scutellum.....*atricaudum* Cockerell.
 The abdomen viewed from above with from 20 to 24 spots.....*garleppi* Schrottky.
- 7.—The mandible armed with seven teeth along its apex. The maculations of the abdomen confined to tergite 5 or to tergites 1 and 5. Femora mostly black.....*nigerrimum* Schrottky.
 The mandible armed with six teeth along its apex. Tergite 6 with a tooth or angle on each side but no spines along the apex. Tergites 1–5 with two maculations each, those on 1 and 5 being the largest. Most of at least the middle and hind femora orange-colored.....*weyrauchi*, new species.

Males

- 1.—Tergites 1–3 of the abdomen with an uninterrupted band, tergites 4–5 with a band that is medianly discontinuous. The pygidium with the median element thin, straight and with a button-like ending, the lateral elements wide, flat and inbent.....*peruviana* Schrottky.¹
 Tergites 1–3 of abdomen without continuous bands, four-spotted, two-spotted or even without any maculations.....2.
- 2.—The tibial and tarsal joints and the "knees" a bright orange color. The abdomen with a maculation on tergite 5 (possibly also sometimes on tergite 1) but otherwise immaculate. Tergite 7 with a tooth or angle at each side and three spines, arranged in a triangle, at the apical middle.....*nigerrimum* Schrottky.
 Not having this combination of characters.....3.
- 3.—The thorax and legs black, immaculate (except for, rarely, the hind metatarsi). The apex of tergite 7 with a median spine flanked on each side by a more or less wide lateral lobe.....4.
- The thorax and legs rather extensively maculated with yellow.....5.
- 4.—Tergites 1–3 (in some instances possibly only tergites 1–2) with a small inconspicuous spot at each of their lateral extremities but the abdomen otherwise wholly black.....*atricaudum* Cockerell.
 The abdomen in dorsal aspect multimaculate, the number of spots ranging from twenty to twenty-two.....*garleppi* Schrottky.²
- 5.—Tergite 7 armed with five spines, of which the middle spine is the shortest, springing from a higher level than any of the flanking spines; spines 2 and 4 longer than spines 1 and 5.....*22-punctatum* Friese.

tion that the apical segment is trispinose with the quinquespinose specification of Friese and the condition revealed, too, by Ecuadorian specimens before me. In fact, it seems rather more likely that Cockerell's *simulans*, which has at the apex of the abdomen of the male "three sharp straight spines, the middle one much shorter than the others," is close to *deceptum* Smith or even, making allowance for some range of variation in the maculations, conspecific with it.

¹ I have not seen this species. The characters have been noted from the description.

² Schrottky described the male of *garleppi* very briefly. Cockerell (1914, Jour. N. Y. Ent. Soc., XXII, p. 314) regarded his own *matucanense* as "very close to *A. garleppi*," or indeed as possibly only "a subspecies of *garleppi*" differing "in the abundant black hair." A small series consisting of both males and females from Tarma, Peru, 3000 meters (J. Soukup) I believe to be *garleppi*, for the females are in accord with Schrottky's description. Yet the accompanying males agree substantially with Cockerell's type, a male, of *matucanense* and I am of the impression that, if my interpretation of *garleppi* is correct, *matucanense* is hardly to be separated from it.

- Tergite 7 with only triple armature along its apex.....6.
- 6.—Tergite 7 terminated by a short median spine that is flanked at each apical extremity
by a very much longer spine.....
..... *simulans* Cockerell (possibly cospecific with *deceptum* Smith).
- Tergite 7 terminated by a short median spine that is flanked on each side by a rather
wide lateral lobe from which the median spine is separated by a distance some-
what less than the width of the lobe at the apex.....*paitense* Cockerell